SECTION 806

POLLUTION, EROSION AND SEDIMENT CONTROL

806.1 Description. This work shall consist of furnishing, installing, maintaining and removing temporary pollution, erosion and sediment control measures; furnishing and placing permanent erosion control features; or a combination of both as shown on the plans or as directed by the engineer.

806.2 Schedule of Work. Prior to the preconstruction conference and the start of construction, the contractor shall submit schedules for the implementation of temporary pollution control and temporary and permanent erosion control work, as applicable, for construction operations. The contractor's schedule shall address specifically the pollution and erosion control measures planned at all streams or other bodies of water. No work shall start until the pollution and erosion control schedules and methods of operations have been approved by the engineer. Any delay of the work resulting from failure to submit acceptable pollution and erosion control schedules and methods of operations will be considered nonexcusable.

806.3 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Fertilizer and Lime	801
Straw for Bales	802
Mulching	802
Seed	805
Geotextile Fabric	1011

806.4 Construction Requirements. The engineer will limit the surface area of erodible earth material exposed by clearing and grubbing or by excavation, borrow and fill operations in accordance with the following. The engineer may direct the contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other bodies of water. Such work may involve the construction of temporary berms, dikes, dams, sediment basins and slope drains, and use of temporary mulches, seeding or other control devices or methods as necessary to control erosion and pollution.

806.4.1 If the engineer determines ditch checks, as shown on the plans, are not suitable due to site conditions, a combination of ditch checks and erosion control blankets or rock blankets shall be designed to effectively reduce flow velocities.

806.4.2 The contractor shall exercise effective management practices throughout the life of the project to control pollution. Pollutants such as chemicals, fuels, lubricants, bitumen, raw sewage or other harmful material shall not be discharged on or from the project. Temporary pollution control measures, such as storage and handling of petroleum products and other pollutants, shall be coordinated with temporary and permanent erosion control features specified in the contract to ensure economical, effective and continuous erosion and pollution control. These requirements will also apply to work within easements designated by the Commission.

806.4.3 The contractor shall incorporate all permanent erosion and pollution control features into the project at the earliest practical time. Temporary measures shall be used to correct conditions that develop during construction which were not foreseen during the design stage, that are needed prior to installation of permanent pollution control features, or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

806.4.4 Clearing and grubbing operations shall be scheduled and performed such that grading operations and erosion control features will follow immediately thereafter. The surface area of erodible earth material exposed at one time by clearing and grubbing, excavating fill or borrow shall not exceed 435,000 square feet (40,000 m^2) within any individual drainage area without installation of erosion controls for that drainage area. The total erodible surface area exposed at one time for an entire project shall not exceed 750,000 square feet (70,000 m^2) without specific, written approval from the engineer.

806.4.5 The engineer will limit the additional amount of erodible surface areas exposed by clearing and grubbing, excavation, borrow and fill operations with the amount of fill area in which the finished grading, mulching, seeding and other such permanent erosion control measures are completed and properly maintained. If seasonal limitations make such operations impractical, temporary erosion control measures shall be taken immediately.

806.4.6 Unless otherwise provided or approved in writing by the engineer, construction operations in streams or other bodies of water shall be restricted to those areas that must be entered for the construction of temporary or permanent structures. Streams or other bodies of water shall be promptly cleared of all falsework, piling, debris or other obstructions placed therein or caused by construction operations.

806.4.7 Fording of streams or other bodies of water with construction equipment will not be permitted, except as allowed by the engineer. Temporary bridges or other structures shall be used wherever an appreciable number of stream or other bodies of water crossings are necessary. Unless otherwise approved in writing by the engineer, mechanized equipment shall not be operated in streams or other bodies of water except as may be required to construct channel changes and temporary or permanent structures. If a Corps of Engineer Section 404 or Department of Natural Resources Section 401 permit is applicable for a project, the permit requirements and conditions will prevail.

806.4.8 The location of all material pits, other than commercially-operated sources, and all excess material sites will be subject to approval from the engineer. Erosion from construction operations and pollution control measures shall not cause water pollution.

806.4.9 In the event of conflict between these requirements and the pollution control laws, rules or regulations of other federal, state or local agencies, the more restrictive laws, rules or regulations will apply.

806.4.10 Unless otherwise specified, or directed by the engineer, all temporary erosion control measures shall be removed by the contractor after permanent erosion control measures are established.

SECTION 806.10 TEMPORARY BERMS

806.10.1 Description. This work shall consist of constructing and maintaining temporary berms of rock or compacted soil at the top of fillslopes or transverse to the centerline of fills.

806.10.2 Material. Temporary berms shall consist of graded material from within the project limits or any other suitable material approved by the engineer.

806.10.3 Construction Requirements. Temporary berms shall be constructed to the approximate dimensions shown on the plans.

806.10.3.1 Type A Berms. Type A berms shall be machine compacted with a minimum of one pass over the entire width of the berm.

806.10.3.2 Type B Berms. Type B berms shall be machine compacted with a minimum of three passes over the entire width of the berm. Material removed from Type B berms shall be incorporated in the embankment when possible. The contractor shall remove and dispose of any excess or unsuitable material to a location approved by the engineer.

806.10.3.3 Type A and Type B Berms. Temporary berms shall drain to a compacted outlet at a slope drain. On transverse berms, the top width of the berms may be wider and the sideslopes flatter to allow equipment to pass over these berms with minimal disruption.

806.10.3.4 Type C Berms. Type C berms shall be constructed of rock base material in accordance with Sec 303.2 or other material as approved by the engineer. A vegetative mulch or an equivalent erosion control blanket shall be placed on the upslope side of the Type C berm. The vegetative mulch shall be placed in such a manner that the final compacted thickness is 2 inches (50 mm). The material for the vegetative mulch shall be in accordance with Sec 802. The straw layer or equivalent erosion control blanket shall be removed and replaced as directed by the engineer.

806.10.4 Method of Measurement.

806.10.4.1 Quantities for Type A berms will be included in Class A or Unclassified Excavation quantities listed in the contract. Final measurement will not be made for Type A berms, except in accordance with Sec 203.8.1.1.

806.10.4.2 Measurement of Type B and C berms will be made to the nearest linear foot (m).

806.10.5 Basis of Payment.

806.10.5.1 Payment for Type A berms will be made at the contract unit price for Class A or Unclassified Excavation and will be considered full compensation for all labor, equipment and material to construct, maintain and remove Type A berms.

806.10.5.2 The accepted quantities of Type B and C berms will be paid for at the contract unit price and will be considered full compensation for berm installation, maintenance, removal and any other work noted on the plans. No additional payment will be made for any costs associated with the straw layer or equivalent erosion control blanket on the Type C berm.

806.10.5.3 Any hand work at slope drain inlets will be considered part of the contract unit price for slope drains.

SECTION 806.20 TEMPORARY SLOPE DRAINS

806.20.1 Description. This work shall consist of constructing and maintaining temporary slope drains to carry water down slopes and to reduce erosion. The method selected shall be approved by the engineer prior to construction.

806.20.2 Construction Requirements. The contractor shall provide temporary, impermeable slope drains to carry water or water with suspended solids down fill slopes until permanent erosion control measures are established. The contractor shall provide temporary slope drains

on fillslopes at approximately 500-foot (150 m) intervals or as directed by the engineer. All temporary slope drains shall be adequately anchored to the slope to prevent disruption of flow. Inlet ends shall be properly constructed to channel water into the temporary slope drain. Outlet ends shall have some means of dissipating the energy of the water to reduce erosion downstream. The contractor shall restore the site of the slope drains to the satisfaction of the engineer.

806.20.3 Method of Measurement. Measurement of temporary slope drains will be made to the nearest linear foot (m).

806.20.4 Basis of Payment. The accepted quantities of temporary slope drains will be paid for at the contract unit price.

SECTION 806.30 TEMPORARY DITCH AND INLET CHECKS

806.30.1 Description. This work shall consist of constructing and maintaining temporary ditch and inlet checks, removing sediment deposits from these checks and disposing of the sediment at a location approved by the engineer.

806.30.2 Material. All material shall be in accordance with Sec 806.3 and the following.

806.30.2.1 Posts. Wood, steel or synthetic posts may be used. Posts shall be of sufficient length, but no less than 4 feet (1.2 m), to ensure adequate embedment while fully supporting the silt fence and shall have sufficient strength to resist damage during installation and to support applied loads while in service.

806.30.2.2 Support Fence. All geotextile silt fences shall be supported either externally by wire or other approved mesh to a height of at least 24 inches (600 mm) or by a suitably designed support system capable of keeping the material erect. Either method shall be strong enough to withstand applied loads.

806.30.3 Construction Requirements.

806.30.3.1 Type I Ditch Checks. Type I ditch checks shall be constructed of straw bales, silt fence or an approved alternative erosion control measure as specified in the contract. Type I ditch checks shall not be used where drainage areas exceed 3 acres (1.2 ha) or where ditch slopes exceed 10 percent. Type II ditch checks may be substituted for Type I ditch checks at the contractor’s expense. Straw bale and silt fence ditch checks shall be constructed as shown on the plans in accordance with the contract documents. Approved alternate Type I ditch checks shall be installed and maintained according to the manufacturer's recommendations.

806.30.3.2 Type II Ditch Checks. Approved alternate Type II ditch checks may be used as shown in the contract. Type II ditch checks shall not be used where drainage areas exceed 50 acres (20.2 ha) or where ditch slopes exceed 10 percent.

806.30.3.2.1 Rock Ditch Checks. Rock ditch checks shall be constructed with clean rock. A minimum of 50 percent of the rock shall have a diameter of 6 inches (150 mm) or greater, with a maximum size of 9 inches (225 mm). Silt fence or an equivalent filter fabric shall be placed beneath the rock ditch check as shown on the plans.

806.30.3.2.2 Sand Bag Ditch Checks. Sand or rock for sand bags shall be a uniform granulation with a maximum aggregate size of 2 inches (50 mm), shall be clean to allow percolation of water through the sand bag and shall meet the approval of the engineer. Sand bags shall be of tightly woven burlap or other material that is sufficiently durable to remain intact for the time intended. Sand bags shall be filled approximately three-fourths full, shall

weigh approximately 55 pounds (25 kg) and shall be securely closed. The sand bags shall be laid in horizontal courses, and successive courses shall break joints with preceding ones. The bags shall be packed against each other and tamped to provide a uniform surface.

806.30.3.2.3 Drop Inlet Checks. Drop inlet checks shall be constructed adjacent to the drop inlet as shown on the plans or as directed by the engineer, as necessary to prevent sediment from entering the inlet. Material shall be in accordance with the requirements of the Type II Ditch Checks or as approved by the engineer.

806.30.3..2.4 Maintenance. The contractor shall replace checks as directed by the engineer. Periodic sediment removal shall include removal and disposal of sediment to a location where sediment will not erode into construction areas, streams or other bodies of water. The contractor shall inspect the ditch checks for sediment accumulation after each storm event and shall remove the sediment when deposits reach approximately one-half the original height of the check. Alternate temporary erosion control methods shall be maintained in accordance with the manufacturer and as directed by the engineer.

806.30.2.5 Method of Measurement. Measurement of sediment removal will be made to the nearest cubic yard (m^3).

806.30.4 Basis of Payment. The accepted quantities of temporary checks will be paid for at the contract unit price for each pay item included in the contract. This shall include constructing, maintaining, repairing and removing and disposing of the check after completion of the work. The contractor will be compensated at the contract unit price if the engineer determines unusual conditions warrant repair or replacement of a check.

SECTION 806.40 SEDIMENT BASINS

806.40.1 Description. This work shall consist of constructing sediment basins as shown on the plans or as directed by the engineer to detain sediment. This work shall also include disposal of excavated material, sediment and basin removal and site restoration.

806.40.2 Construction Requirements. The area where a sediment basin is to be constructed shall be cleared of vegetation to enable sediment removal. The sediment basin shall be an excavated or dammed storage area with defined sideslopes. Inlet and outlet areas shall be lined with rock riprap.

806.40.2.1 The inlet of a sediment basin shall be constructed with a wide cross-section and a minimum grade to prevent turbulence and to allow deposition of soil particles. When the depth of sediment reaches one-half the original depth of the sediment basin in any part of the pool, all accumulation shall be removed.

806.40.2.2 The contractor shall dispose of accumulated sediment and excavated material removed during the construction of the sediment basin in locations where the material will not erode into the construction areas, streams or other bodies of water.

806.40.2.3 Sediment basins shall remain in service until all disturbed areas draining into the structure have been satisfactorily stabilized. When use of a temporary sediment basin is to be discontinued, the contractor shall remove any sediment and backfill, properly compact all excavations, restore the area to the existing ground's natural or intended condition, and seed and mulch in accordance with Secs 802 and 805.

806.40.3 Method of Measurement.

806.40.3.1 Measurement of sediment basin excavation and sediment removal will be made to the nearest cubic yard (m^3).

806.40.3.2 Measurement of all seeding required after the sediment basin is built, after removal of the sediment basin and for site restoration will be in accordance with Sec 805 .

806.40.4 Basis of Payment.

806.40.4.1 The accepted quantities for constructing a sediment basin and for sediment removal will be paid for at the contract unit price.

806.40.4.2 Payment for all seeding and mulching required after the sediment basin is built, after removal of the sediment basin and for site restoration, will be in accordance with Sec 805.

806.40.4.3 If additional clearing and grubbing is necessary for construction of a sediment basin, payment will be included in the contract unit price for sediment basin.

SECTION 806.50 TEMPORARY SEEDING AND MULCHING

806.50.1 Description. This work shall consist of furnishing and applying fertilizer, seed, vegetative mulch or other acceptable cover authorized by the engineer. This work shall produce a quick ground cover to reduce erosion in disturbed areas expected to be redisturbed at a later date. Finish grading of areas will not be required. Hydraulic seeding and fertilizing in accordance with Sec 805 will be permitted.

806.50.2 Construction Requirements. Seeding and mulching shall be a continuous operation on all cut and fillslopes, excess material sites and borrow pits during the construction process. All disturbed areas shall be seeded and mulched as necessary to eliminate erosion.

806.50.2.1 The contractor shall provide permanent seeding and mulching as shown on the plans following temporary seeding.

806.50.2.2 Temporary seeding mixtures of cereal grains shall be applied at a rate of 100 pounds per acre (110 kg/ha). All erodible seeded areas shall provide a minimum of 20 plants of the species planted per square foot (0.04 m^2) on at least two random counts per acre (0.5 ha) in representative areas of the field. For areas with a large percentage of rock, the number of living plants shall be proportional to the percentage of erodible surface, as determined by the engineer. The counts will be conducted 60 days after the species is planted.

806.50.2.3 Mulch placed over temporary seed mixtures shall be applied in accordance with Sec 802.

806.50.2.4 Fertilizer shall be applied at a rate of 40 pounds (45 kg) nitrogen (N) per acre (ha).

806.50.2.5 Lime will not be required for temporary seeding.

806.50.3 Method of Measurement. Measurement of all temporary seed mixtures and accompanying mulch will be made to the nearest 1/10 acre (0.05 ha).

806.50.4 Basis of Payment. The accepted quantities of all temporary seed mixtures and the accompanying mulch will be paid for at the contract unit price per acre (ha).

SECTION 806.60 BLANK

SECTION 806.70 SILT FENCE

806.70.1 Description. This work shall consist of furnishing, installing, maintaining, removing and disposing of a silt fence designed to remove suspended particles from sheet flow passing through the fence and to prevent sediment from polluting nearby streams or other bodies of water. The quantities of silt fence shown on the plans may be increased or decreased at the direction of the engineer. At the engineer's discretion, the location may be modified to fit field conditions. Such variations in quantity will not be considered as a change in work.

806.70.2 Material. All material shall be in accordance with Sec 806.3.

806.70.2.1 Posts. Posts shall be in accordance with Sec 806.30.2.1.

806.70.2.2 Support Fence. Support fences shall be in accordance with Sec 806.30.2.2.

806.70.2.3 Prefabricated Fence. Prefabricated fence systems may be used if the systems meet all of the above material requirements.

806.70.3 Construction Requirements.

806.70.3.1 Straw Bales. The contractor shall place bales at the bottom of embankment slopes or on the lower side of cleared areas to divert runoff and to detain sediment from sheet flow. When used to divert runoff or detain sediment, the bales shall be adequately anchored to withstand the applied load.

806.70.3.2 Fabric Fence. The contractor shall install silt fence as shown on the plans and at other locations directed by the engineer. Fence construction shall be adequate to handle the stress from hydraulic and sediment loading. Fabric at the bottom of the fence shall be buried a minimum of 6 inches (150 mm) to prevent flow under the barrier. The trench shall be backfilled, and the soil compacted over the fabric. Fabric splices with a minimum 2-foot (600 mm) overlay shall be located only at a support post. Any installation method acceptable to the engineer will be allowed as long as the effectiveness and intent of the silt fence is achieved. All geotextile construction shall be in accordance with Sec 624.

806.70.3.2.1 Post spacing shall not exceed 5 feet (1.5 m). Posts shall be driven a sufficient depth into the ground or placed on closer spacing as necessary to ensure adequate resistance to applied loads.

806.70.3.2.2 The silt fence shall be fastened securely to the upslope side of the post. When wire support fence is used, the wire shall extend into the trench a minimum of 2 inches (50 mm).

806.70.3.3 Maintenance. The contractor shall maintain the integrity of silt fences as long as the fences are necessary to contain sediment runoff. The contractor shall inspect all silt fences immediately after each rainfall and at least daily during prolonged rainfalls. Any deficiencies shall be immediately corrected by the contractor. In addition, the contractor shall make a daily review of the silt fences in areas where construction activities have changed the natural contour and drainage runoff to ensure the silt fences are properly located for effectiveness. Where deficiencies exist, additional silt fences shall be installed as approved or directed by the engineer.

806.70.3.4 Sediment. The contractor shall remove and dispose of sediment when accumulations reach approximately one-half the fence height, or sooner when directed by the

engineer. If required by heavy sediment loading, a second silt fence shall be installed as directed by the engineer.

806.70.3.5 Removal. The silt fence shall remain in place until removal is directed by the engineer. Upon removal, the contractor shall remove and dispose of any excess silt accumulation, grade and dress the area to the satisfaction of the engineer, and establish vegetation on all bare areas in accordance with the contract requirements. The fence material shall remain the property of the contractor.

806.70.4 Method of Measurement. Silt fence will be measured to the nearest linear foot (m) from end to end of each separate installation.

806.70.5 Basis of Payment. The accepted quantities of silt fence will be paid for at the contract unit price.

SECTION 806.80 TEMPORARY PIPE

806.80.1 Description. This work shall consist of installing and removing temporary pipe utilized to carry water under temporary roadways, silt fences, berms or other locations determined by the engineer and to prevent the contractor's equipment from coming in direct contact with water when crossing an active stream, intermittent streams created during heavy rainfalls or other bodies of water.

806.80.2 Material. Any pipe approved by the engineer may be used.

806.80.3 Construction Requirements. Installation of temporary pipe shall be in accordance with the specifications for permanent pipe and shall prevent water from causing erosion around the pipe. All backfill material for pipes shall be placed in 6-inch (150 mm) lifts and mechanically compacted. Compaction tests will not be required. Temporary pipe placed in intermittent or active streams shall be backfilled with clean rock.

806.80.4 Method of Measurement. Measurement of temporary pipe will be made to the nearest linear foot (0.5 m).

806.80.5 Basis of Payment. The accepted quantities of temporary pipe will be paid for at the contract unit price. Unless provided as a pay item in the contract documents, no direct payment will be made for the placement and removal of the backfill material or rock.

SECTION 806.90 TEMPORARY EROSION CONTROL BLANKETS

806.90.1 Description. This work shall consist of furnishing and placing erosion control blankets on slopes or ditches for short-term or long-term protection of seeded areas at locations shown on the plans or as directed by the engineer.

806.90.2 Material. Erosion control blankets shall be used as designated in the contract or as approved by the engineer. The contractor shall provide prequalified erosion control blankets of the class and type specified in the contract documents or as approved by the engineer. A manufacturer’s certification for each type of blanket used stating that the blankets are in accordance with Sec 1011 shall be provided to the engineer.

806.90.3 Construction Requirements. Erosion control blankets shall be installed and maintained according to the manufacturer's recommendations.

806.90.4 Method of Measurement. Measurement of erosion control blankets will be made to the nearest square yard (m^2) of surface area covered by the completed mat.

Basis of Payment. The accepted quantity of blanket will be paid for at the contract unit price for each of the pay items included in the contract. If blanket is used in lieu of other erosion control measures, payment will be made at the contract unit price for the pay items in the contract for the respective items that the blanket replaces.

SECTION 806.100 TEMPORARY STREAM CROSSING

806.100.1 Description. This work shall consist of constructing a temporary stream crossing to facilitate the movement of equipment across a stream.

806.100.2 Material. Rock furnished for temporary stream crossings shall be in accordance with Sec 303.2.

806.100.3 Construction Requirements. The contractor shall be responsible for the design, installation, maintenance and removal of the temporary stream crossing and any structures installed for the construction of the temporary stream crossing. Appropriate measures shall be taken to maintain near normal downstream flows and to minimize flooding upstream. The temporary stream crossing shall be constructed to permit the free movement of the stream's aquatic life.

806.100.3.1 Prior to construction of the temporary stream crossing, all information shall be submitted to the engineer as needed for the issuance or modification of the Corps of Engineer permit. The contractor shall not begin construction on any temporary stream crossing without written permission from the engineer.

806.100.3.2 All approaches to the temporary stream crossing shall be maintained such that all storm water runoff is diverted to retention devices.

806.100.3.3 When the temporary stream crossing is no longer needed, the crossing shall be removed as soon as possible and the area shall be restored to pre-project conditions or to the satisfaction of the engineer.

806.100.4 Basis of Payment. No direct payment will be made for the design, installation, maintenance or removal of temporary stream crossings. The contractor shall be responsible for all costs, including damage and penalties.